

# **Section 352 Overview Mechanical Engineering**

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# Outline

- **Section products**
- **Customers**
- **Technology responsibilities**
- **Use of the Engineering Support Contract**

# Main Products

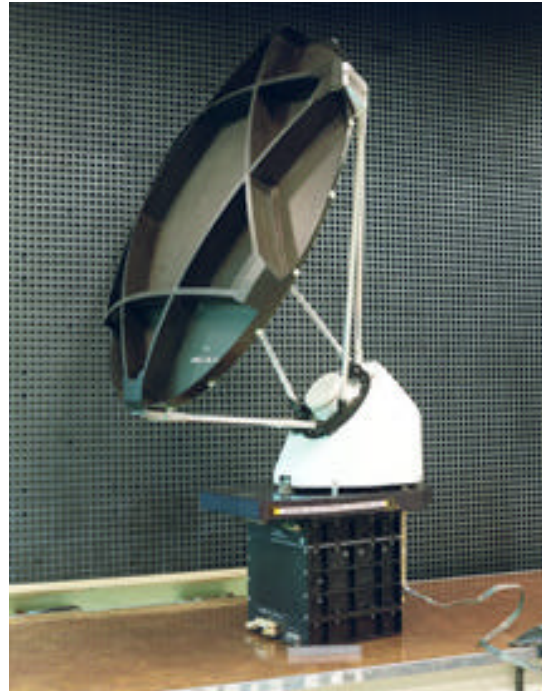
- **Flight Mechanical Hardware**
  - Spacecraft
  - Instruments
  - Rovers
- **Future Program Studies**
- **Mechanical Engineering**
  - Configuration
  - Mass Properties
- **Design**
- **Analysis and Simulations**
  - Loads
  - Dynamics
  - Kinematics
- **Integration and Test**



# Flight Hardware Examples



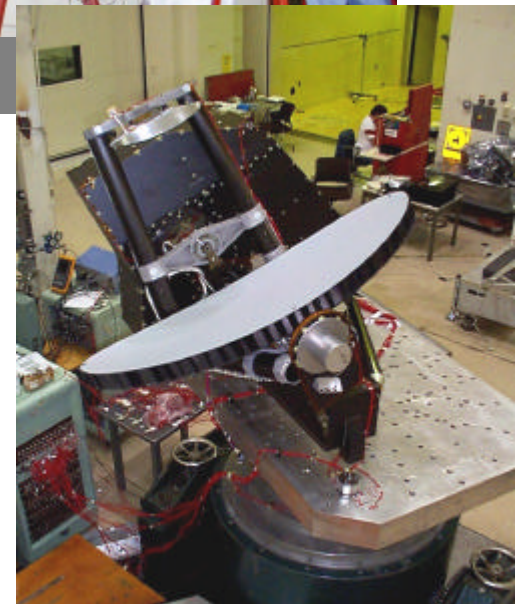
**Genesis Solar  
Wind Collector**



**JASON Microwave  
Radiometer**



**TES Structure**



**MLS**



# Flight Hardware Examples - con't



**MER Air Bag System**

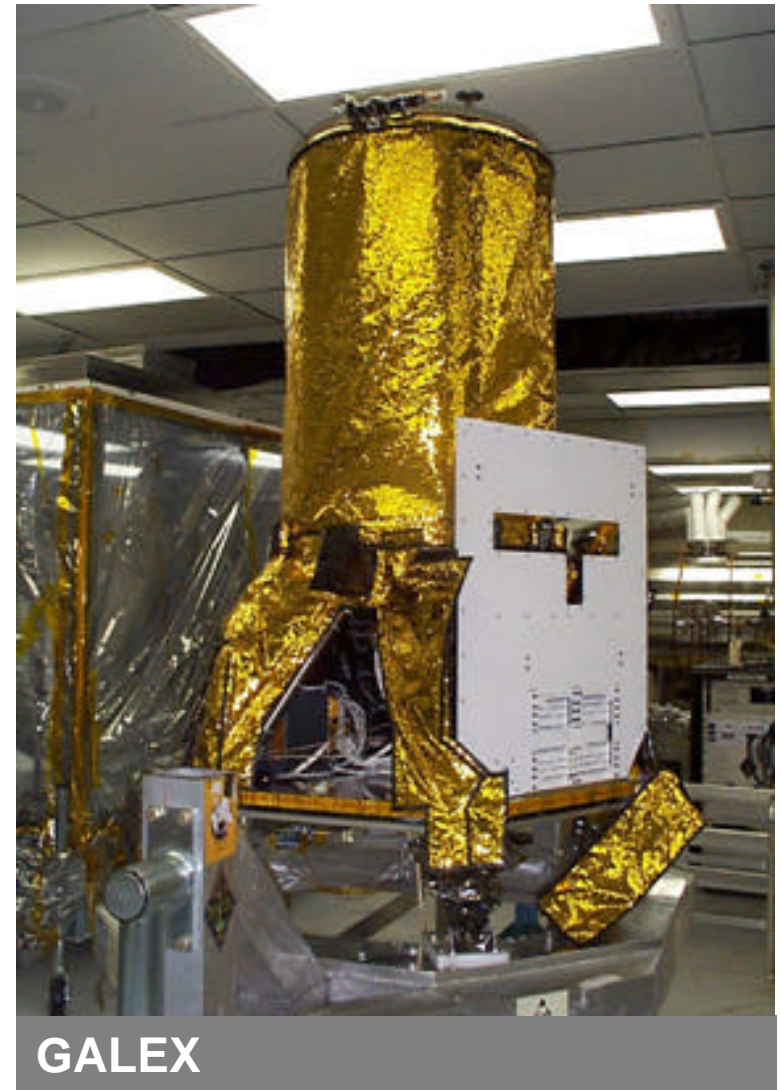


**Tunnel Test – Viking Chute and Backshell**



**Mars '03 Rover Wheel**

# Flight Hardware Examples - con't

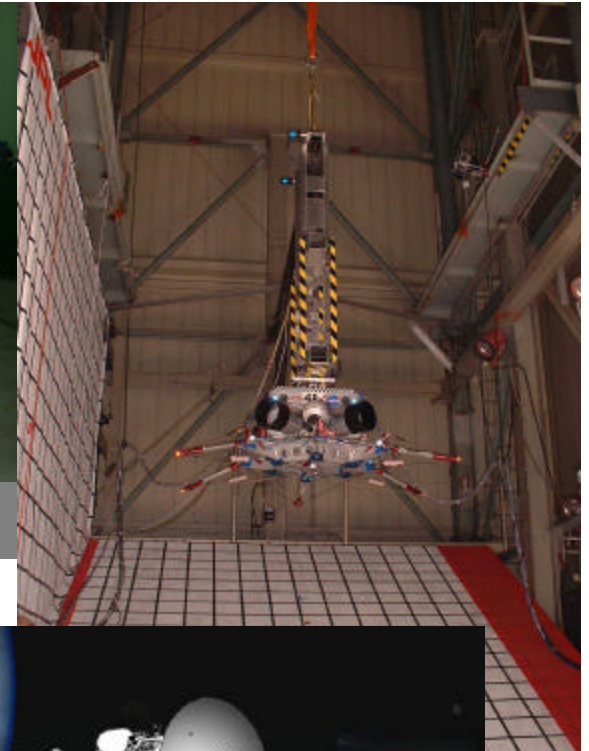




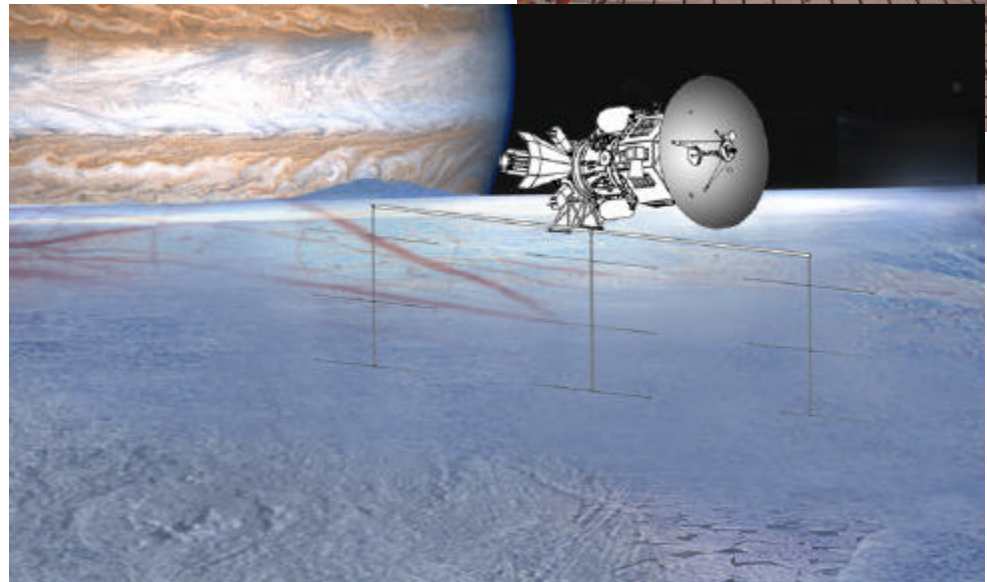
# Future Program Study Examples



Mars '07 lander prototype



Mars '07 Rover Prototype

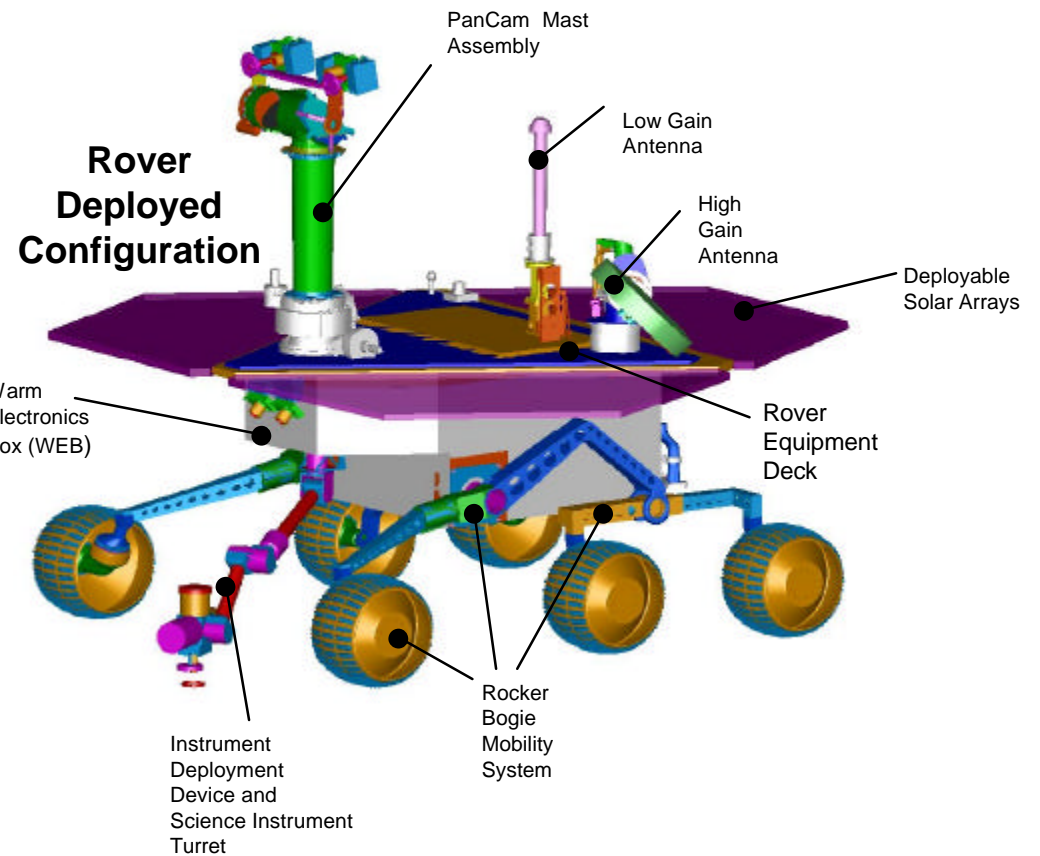
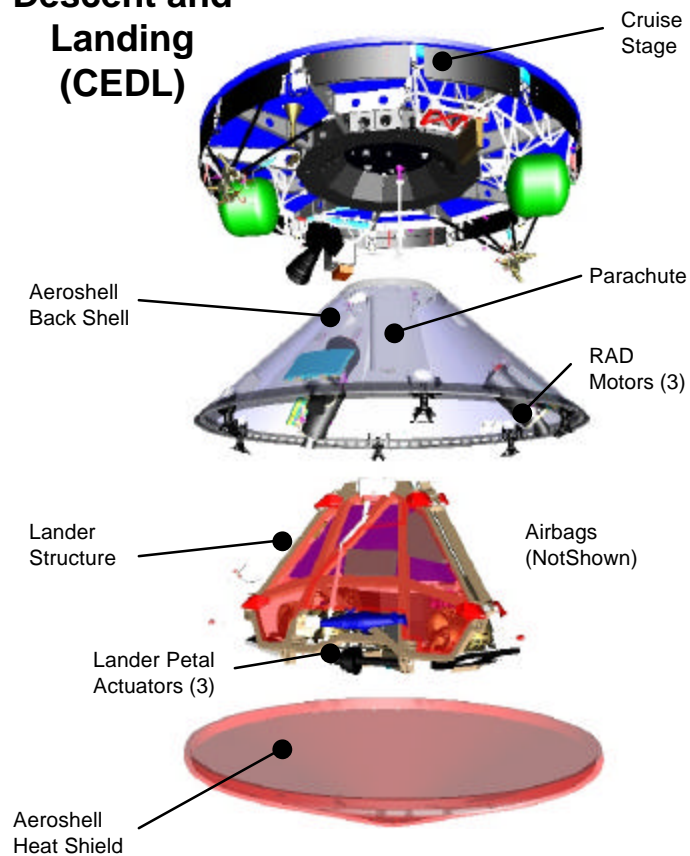


Europa Orbiter

# Configuration Studies

## MER Example

### Cruise, Entry, Descent and Landing (CEDL)





# Other Major Products

- **Contract Technical Management**
  - Deep Impact
  - MRO
  - Mars Odyssey
- **Technology Applications**
- **Proposal support**
  - Team X / Team I
  - Proposal managers
  - Proposal study support
- **Connector/Wire Store**

# Flight Projects and Technology Customers

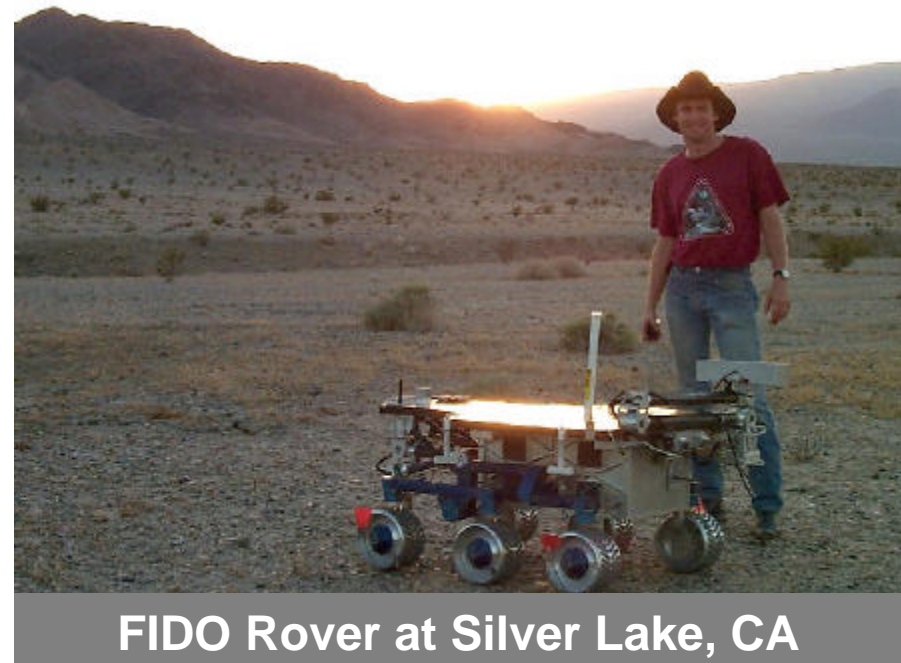
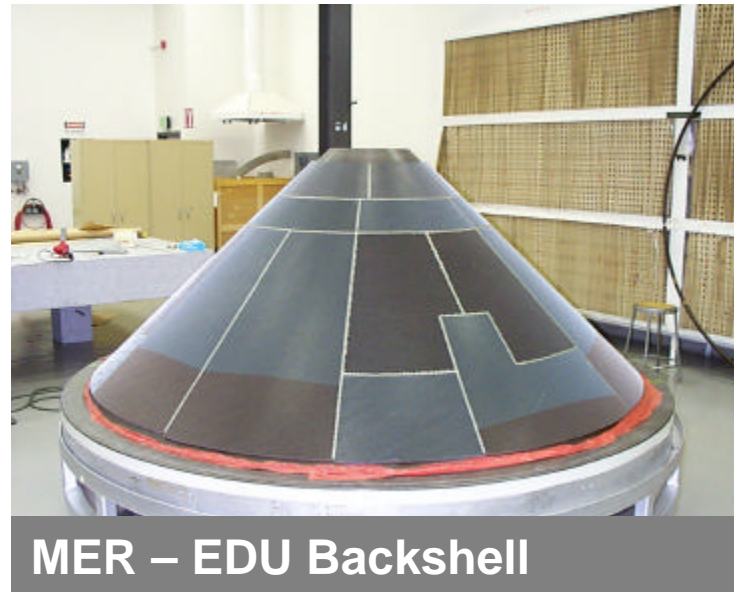
- MER
- CloudSat
- MLS
- TES
- Genesis
- Europa
- GALEX
- StarLight
- SeaWinds
- MIRO
- Jason 1
- Jason 2
- AIRS
- SIM
- Deep Impact
- MRO
- Mars Smart Lander
- Mars Odyssey
- GRACE
- DSN
- LTMPF
- ST-7
- SIRTf
- Technology
- Proposals
- DRDF/RTOP/NRA
- Technical Infrastructure

# Technology Responsibilities:

- **Rover**
- **EDL**
  - Airbags
  - Aeroshell
  - integration
- **Actuation**
  - SMA
  - Dual drive
  - Miniature 2-axis gimbal
  - Pyrotechnics
- **Basic structure**
  - Large space structure
  - Lightweight large apertures
- **Materials**
  - Thin films
  - Thermal control coatings
  - Advanced composites/multi-functional materials



# Technology Infusion



# **Skills**

- **Cognizant Engineers**
  - **Structure**
  - **Mechanism**
  - **Opto-mechanical**
  - **Cabling**
  - **Mechanical ground support**
  - **Pyrotechnics**
- **Mechanical Specialists**
  - **Materials**
  - **Loads**
  - **Dynamics**
  - **Stress**
  - **Designers**
  - **Mechanical integration and test**

# **How Section 352 Utilizes the Engineering Support Contract**

- **Section 352 utilizes the Engineering Support Contract for both flight projects and technology tasks.**
- **Tasks are initiated to support engineers in 352 or on behalf of other customers at JPL.**
- **The Engineering Support Contract is used to augment many disciplines in 352.**
  - **Mechanical CAD modeling and design**
  - **Structural Analysis**
  - **Mechanical Engineering design and fabrication**
  - **Ground Support Equipment**